Emerging trends in the Italian housing market. First attempts to analyse the current real estate crisis impact on the Italian context. Which oncoming market expectations?

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Emerging Trends in the Italian Housing Market

First attempts to analyse the current real estate crisis impact on the Italian context. Which oncoming market expectations?

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Abstract

The Subprime mortgage crisis has been contracting the liquid assets capacity in many countries, causing an economic-financial recession with problems that differ depending on the market sectors and geographic areas. As a consequence, the typical risk inclination of the investors' profile, which was the rule in the recent years, has been progressively reducing. It follows that today, in order to satisfy the greatly increased demand for even more updated and reliable information, a more frequent strategic monitoring of the local real estate market trends should be carried out.

The study proposes a time – series analysis of the Italian housing market from 1967 to 2008, a year in which the Italian real estate market faced a conjuncture and cyclic slow down within the deeper current structural crisis in the international economy. In particular, apart from the main cities usually monitored by the most important half – yearly Official Reports, this study examines less important cities as well, dividing emerging trends, at the same time into "urban rank", "geographical location" and "inner district area".

In particular the result of the analyses shows that, while the major Northern city centres tend to be losing attraction, performances are increasing in some Southern urban centres, probably due to belated start up in redevelopment policies (See: Sicily, Calabria and Apulia regions).

This paper aims to find out, if there are particular locations (central, mid-central or outlying urban areas) in the Italian housing market, in which it is still possible to make an appropriate investment in real estate, contrary to the general national situation.

Key words: Trend Analysis - Profitability - Market Cycle - Investment – Spatial Uniformity

Introduction

By 2003 the international Real Estate participation in the financial markets greatly increased, even exposing the Italian Property Market to the well–known USA Subprime loans crisis.

The uncertain economic context caused by the bursting of the Real Estate bubble has created an on going recession, particularly perceived in terms of investments.

In this framework the Italian Real Estate Market has been drawn into the international crisis in a marginal and particular way.

While the International Subprime market had grown in the USA from 1% to 5,25% during the years 2003 – 2007, thanks to a convenient tax system, in Italy this phenomenon remained quite marginal, below a 4% increase (EU average level). Key factors as the onerous Italian tax system, and in comparison with other Countries, a lower profitability expectation, have protected our country from the highly dangerous consequences produced elsewhere [1].

Italy is clearly very characterised by a host of highs and lows in its economic development, which differ depending on "geographical position" and "urban rank".

To support this statement let's examine "Fig 1", in which we present the last four Italian Housing Market cycles, from 1967 to 2008. On the left some metropolitan area trends have been represented (Turin, Milan, Florence and Rome), while, on the right, we show some smaller cities, belonging to the same Regions.

Note that it is possible to compare the various trends of the two groups (major and minor cities) with the average trend (reduced flow) at the bottom of the table. With reference to the last two cycle peaks (1991 and 2007), highs and lows have been indicated.

[1] Source: III Real Estate Report - Nomisma 2007.

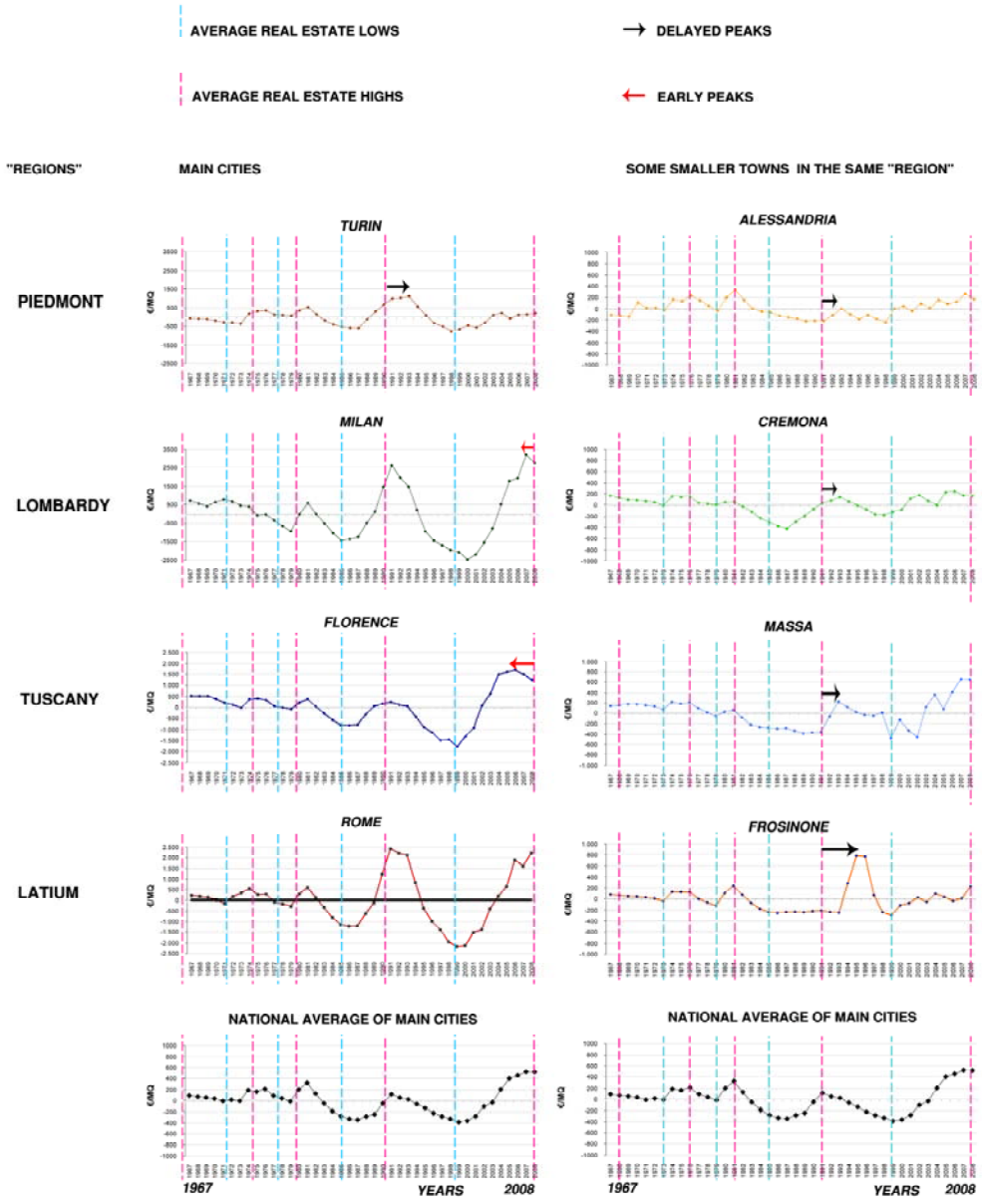
We can observe that:

- Turin excluded, all major cities reached their price peaks in 1973 (first), 1981 (second), 1990 (third) and 2007 (fourth);
- Turin and Rome excluded, the metropolitan areas herewith analysed are facing the current Real Estate market reversal earlier than the others;
- Turin, in particular, shows a 2 – 3 year delay in comparison with the national average trend;
- the smaller cities do not clearly evidence the four Real Estate cycles (i.e. note that the 1990's peak had, on average, a 3 years delay).

From these preliminary results it is possible to conclude that:

- the market delays in the smaller cities can be interpreted as an advantage to be exploited during the current cycle reversal;
- investments which are made to be done in smaller towns permit a lower investment exposition in relation to the macro – cycle reversal.

Fig.1: **Trend analysis: a comparison between main and smaller cities**

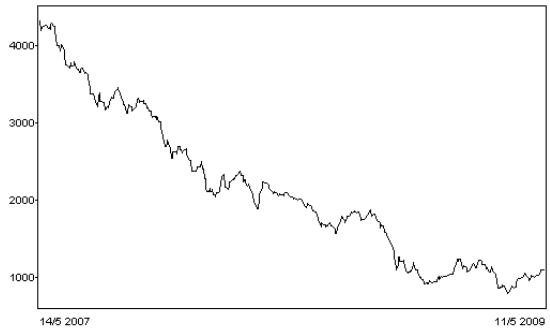


Source: Authors processing on "Il Consulente immobiliare" data.

These hypotheses can be confirmed by the principal Overviews recently published by the major national Real Estate Institutes (Scenari Immobiliari[2], Nomisma[3], Ufficio Studi UBH[4]).
As previously said, the Italian housing market faced a first slowing down during 2005, especially in the main cities, such as Milan and Florence.
In response to this fact, and to confirm our suppositions, we recall what Scenari Immobiliari forecast in 2006, concerning the probable shift of demand towards smaller urban areas, especially in Southern Regions.
According to Scenari Immobiliari, these Regions, which so far have remained in the background, could now express new housing investment opportunities.
Furthermore we have to consider the trend of the following indexes:

- the Real Estate MIB index has been facing a 3-monthly negative variation since the trend reversed in May 2007 (see "Fig. 2", where the full Index drop is represented[5]);
- the number of purchases and sales has been facing a decline since 2007 all over Italy[6];
- since 2007 the price growth has been less relevant than the inflation rate spread (and, in particular, it ranged between a 0,9% max in Milan and a -0,4% min in Naples)[7];
- the selling time has reached on average a 6,5 months[8];
- the construction costs in the residential sector has been increasing by 2,4% over the last two years.[9]

Fig.2: the Real Estate MIB Index from 2007 to 2009.



Source: www.euroinvestors.it

It follows that we need to find out which cities are characterized, on the one hand by a larger component of "systemic risk" and which, on the other hand, might allow an appropriate investment considering the predominance of a lower "specific risk" level.
It must be remembered, in fact, that while the "systemic risk" is generally considered "not eliminable", as it is related to exogenous variables (such as, for example, the national and local turnover level, the economic cycles, and the interest rate structure), the "specific risk" is more connected with strictly local variables (such as the demographic trends, the construction costs or the demand and supply dynamic).

Considering the previous distinction, on the basis of the major Real Estate recent Overviews, the short-middle term forecasts indicate:

- a forthcoming diversion between high and low sub market trends, with a growing demand for high quality Real Estate especially in Northern Italy;
- a probable expansion of the housing demand, especially in small towns, and in the "second – houses" property sector ("holiday resorts" sub market)[10];

[2] www.scenari-immobiliari.it.
[3] www.nomisma.it.
[4] www.ubh.it.
[5] It is possible to custom a Real Estate Mib index graph at the following link: http://www.euroinvestor.it/Stock/ShowStockInfo.aspx?StockId=556367
[6] Source: Ufficio Studi UBH, 2008.
[7] Source: III Real Estate Report - Nomisma 2008.
[8] Source: III Real Estate Report - Nomisma 2008.
[9] Source: ISTAT, 2008.
[10] Source: Ufficio Studi UBH, 2007.

- a preference for investments able to increase the operational revenues rather than to generate transformation values through property re-development (note that in the residential sector it means a shift of interest towards residences, university campuses, etc..)[11];

Apart from the topics above argued, we now introduce a second point of view tested on the data analysis herewith presented. We intend also to verify if there are cities in which suburbs affected by recent urban recoveries or new competitive land uses might benefit in terms of "urban quality", as an externality causing an increase in housing prices. These locations, in which a polycentric city model might be created, could represent an opportunity not only for families, but for qualified investors as well.
By the way we remember what the British Prime Minister Gordon Brown recently underlined: "…the re-development of suburban areas might represent a key driver, fivefold greater than the city centres. The polycentric or reticular spatial model is more suitable to respond to the new competitiveness needs …"[12].
The first topic (related to the type of investment risk) could be verified analysing the time series trends. The second needs might be demonstrated jointly to the presence of dummy variables such as "urban regeneration policies" or "extraordinary events" intended to overcome or, at least, to reduce, the opposition between urban centres and peripheral locations.

1. The dataset and the analysis

The analysis is supported by a dataset that our research Institute SiTI[13] is processing together with some remarkable national Institutes[14] to support the JESSICA evaluation system. JESSICA (Joint European Support for Sustainable Investments in City Areas) is an initiative promoted by the European Commission with the aim of supplying qualified investors (i.e. Banking Foundations) in promoting investments for sustainable regenerations actions in city areas[15].
In order to set a cluster analysis on the basis of Real Estate competitiveness we used some preliminary indexes, developed by the JESSICA Italian Team, such as the "demographic attractiveness" and the SiTI index concerning a dynamic yield analysis on central locations (time series 2001 – 2008) to the trend analysis.
Finally the model considers the "urban rank"[16] and the average "price level" in order to obtain the ranking of the most and the least expensive locations.
This paper proposes two studies both completed on the basis of prices quotations (from 1967 to 2008):

1. Emerging Trend analysis divided, by location and urban position;
2. Trend of the spatial uniformity of the Real Estate value.

[11] Source: Ufficio Studi Gabetti 2008.
[12] Quoted in: F. Erbani, *Quando esplode la periferia*, La Repubblica, 16 marzo 2006.
[13] SiTI (Higher Institute on Innovation Territorial Systems) is a non-profit association, set up by the Polytechnic of Turin and the "Compagnia di San Paolo" (Banking Foundation) in order to produce research towards innovation and socio-economic growth.
For more information: www.siti.polito.it/eng/home.htm
[14] The other italian Institutes involved in the "JESSICA System" research are:
- Prometeia (it is one of the largest Italian companies in financial and economic research and consulting): www.prometeia.it
- Ismu (it is a foundation developing demographic research programs) www.ismu.org
[15] More information on JESSICA program are available on:
- www.eib.org (European Investment Bank)
- http://ec.europa.eu/regional_policy/funds/2007/jjj/jessica_en.htm
[16] We have distinguished 5 clusters on the basis of the inhabitants number.

1.1. Study n.1 - Emerging Trend analysis divided by location and urban position[17]

The study examines 94 Italian Main Towns[18]. For each Main Town we present comparable data, analysed during three different and significant trend periods.
As stated in the introduction, study n.1 divides three main trend periods by "urban rank", "geographical location" and "inner district area".
Note that:

- the raw data, collected from "Il Consulente Immobiliare", are all expressed in euro;
- the three main periods were selected in order to check and show specific trend aspects:

a. *1° Trend Period : 1967 – 2008 (always positive)*
- this is useful to compare the residential quotations (inflation rate-free) over a long period;
- this enables to identify, for each city, 4 Real Estate market cycles;
- this allows us, on the one hand, to understand how the national and international macroeconomic drivers have impacted on the Real Estate market and, on the other hand, to find out which urban areas have local and specific dynamics.

b. *2° Trend Period: 2000 – 2008 (predominantly positive)*
- this shows the last 8 year trend (inflation rate-free);
- this shows the final ascending stretch of the last Real Estate cycle;
- this allows us to evaluate where the effects of recent urban policies have speeded up the rise in pricing.

c. *Percentage variation between 2007 and 2008 in price quotations (on average decreasing)*
- this shows the effects produced by the present Real Estate crisis in the Italian context;
- values are considered "constant".

1.1.1 Study n.1: Analysis Results

While some results could seem self-evident for those who know Italy and its economic development from the '60s, others are nevertheless interesting and not immediately obvious.
The results are presented in two paragraphs: the first concerns the "geographical position" and the second "the urban rank".

Analysis by geographical position[19]
During the last 40 years the residential market of Northern Italy, in which some major metropolitan areas are located (Milan, Turin, Genoa), shows a great increase in all areas (centre, mid-centre and suburbs).
Northern and the Central Italy are both placed both above the National average, especially the historical city centres of Emilia Romagna and Tuscany.
Only the Southern Regions never exceed the average values, and, what's more, the existing gap between central and suburban areas is extremely high. This is a further confirmation of what observable in the ranking of the Islands (Sardinia and Sicily), in which the city trends are far more imbalanced among their inner district areas.
To sum up, the Real Estate Markets of the Northern and Central Regions, such as Emilia Romagna, Tuscany, Veneto and Lombardy, seem to have been manteined housing values during the last 40 years, followed by Liguria, due to its double facet of industrial pole (in Genoa especially) and typical holiday location (causing the well known "second houses" development).

[17] Study n. 1 was carried out by arch. Luisa Ingaramo and arch. Stefania Sabatino.
[18] Note that at present the number of the Italian Main Towns (the so called "Capoluoghi di Provincia") is moving from 103 to 107. This paper concerns only 94 urban areas as it was the number existing in 1995. This choice has enabled to compare all the results from 1967 to 2008.
[19] See Fig. 11, at the end of study n. 1, to look over our full results.

Analysis by urban rank[20]

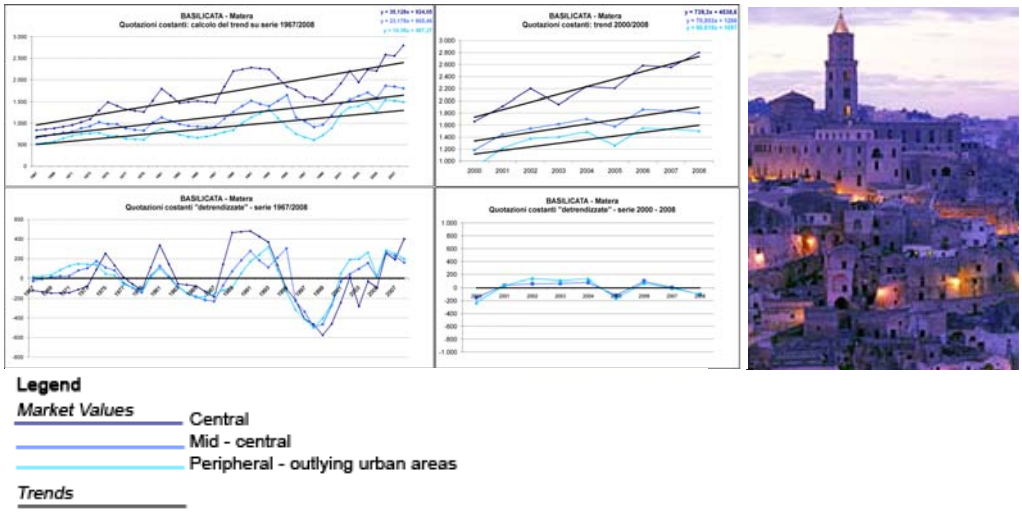
Moving from the "geographical position" to the "urban rank" analysis (set on the basis of the number of inhabitants in 2008)[21] the study is provided with further details widening our observations. The trend advantage of some greatly populated cities is supported by the high price level index (maximum in Milan, equal to 12,000 €/sq m, very high in Rome, equal to 11,000 €/sq m and up to 9,000 €/sq m in Naples).

Milan, Rome and Naples are obviously placed at the top of the ranking both in the 1967-2008 trend period and in the last eight years, followed by Venice and Florence.

However, we can observe a surprising trend performance, during the last eight years, in towns and cities below the threshold of 400.000 inhabitants, such as Reggio Calabria, Leghorn, Matera, Siena, Imperia and Ferrara, in which the purchasing prices rose particularly in the central districts.

While the results of the most populated cities are somehow expected (the number of inhabitants in Naples is over 950,000 and nearly 3,000,000 in Rome) the outcome is not obvious for Matera (just above 60,000 inhabitants). Matera, in fact, during the last eight years reached the higher percentage increase in the Italian ranking of central districts.

Fig. 3: **Trend analysis – Matera (UNESCO site since 1993)**



Source: Authors processing on "Il Consulente Immobiliare" data.

Supposing that this were the short-list of the cities in which it is possible to make an appropriate investment, we have to note that none of them reveal a good yield level. Milan, for instance, even maintaining the highest 2008 yield level (equal to 11%), has dropped its profitability level by -25% since 2002.

[20] See Fig. 13, at the end of study n. 1, to look over our full results.

[21] Source: ISTAT 2008.

In brief, the positive drivers remaining in the major metropolitan areas are, beyond doubt:

- the absolute profitability level (on average equal to 3-4%);
- a high price level, thanks to the huge increase of the last 40 years;
- a particular increase in the percentage variation of residential prices, above all registered in central and mid-central districts, as the last eight year trend analysis reveals.

The standstill or the decline in performance in the major cities can be attributed to the following:

- the outcome produced by the speculative Real Estate Bubble which has amplified its peculiar effects in the metropolitan areas more exposed to the international markets;
- the saturation reached in the cyclical market process specifically in the biggest cities;

Exceptions in low performance of the major metropolitan areas are:

- Rome, in which the Real Estate values are continuing their growth (about +9% since 2007), shows the best performance in the semi-central areas (equal to +13%);
- Turin,which records the best combined performances of all the various indexes analyzed. Piedmont's capital city, in fact, even presenting a medium price level (on average the maximum value for central locations does not exceed 4.000 €/mq) holds an advantage regarding the trend dynamics: in all the three periods analyzed in this study, centre, mid-centre and suburb locations have been constantly increasing.
- Venice. The city, in fact, shows quite a high performance both in the dynamic yield (+22% since 2002) and in price levels (on average up to 8,500 €/sq m).

As previously mentioned, the aim of the study is to find out if towns in Italy commonly not considered by the most important national Overviews, offer new investment opportunities.

To this purpose we tried to combine the results excluding:

- some northern main towns on the Piedmont-Lombardy axis (such as Vercelli, Novara, Lecco; all little towns in the shadow of major cities - Milan and Turin);
- all the main urban areas showing a demographic loss of attractiveness (some examples: Genoa, Milan, Naples, Bari, Padua, Trieste, Pavia, Gorizia, Oristano).

And, at the same time, considering those cities showing a good performance in:

- dynamic profitability, mostly emerging in the Central and Southern Regions (Perugia, scoring a +79% since 2002, gains the first position, followed by Catanzaro, Cuneo, Siracusa, Trieste, Cremona, Foggia, Piacenza, Bologna, Ragusa, Padua);
- demographic attractiveness, confirming a good performance in Central and Southern Regions for cities that do not exceed the 150,000 inhabitants (Cremona, Latina, Pescara, Pistoia, Ravenna, Rieti, Viterbo, Vicenza);
- a growing appeal caused by the presence of Heritage and Amenities (Lecce, Matera, Siena, Caserta, Lucca, Pisa, Ferrara, Parma, Verona, Vicenza, Modena, Perugia Ravenna and Siracusa);
- presence of branches of main university (Milan and Turin Polytechnic, Università Cattolica, etc.).

Among the above mentioned locations, for different features, we highlight: Piacenza and Perugia in the North, Messina, Ragusa and Siracusa in Sicily, Lecce and Foggia in Apulia.

Fig. 4: **Trend analysis – Turin: venue of 2006 Olimpic Winter games**

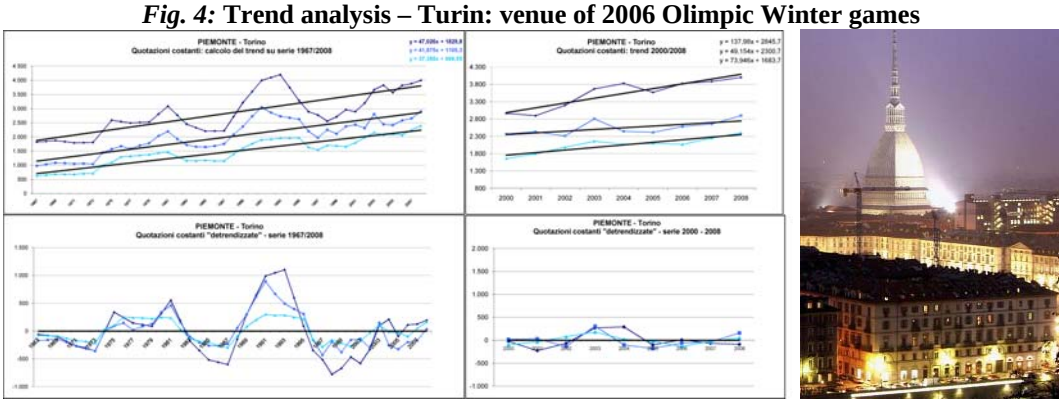


Fig. 5: **Trend analysis – Rome: Real Estate values still growing**

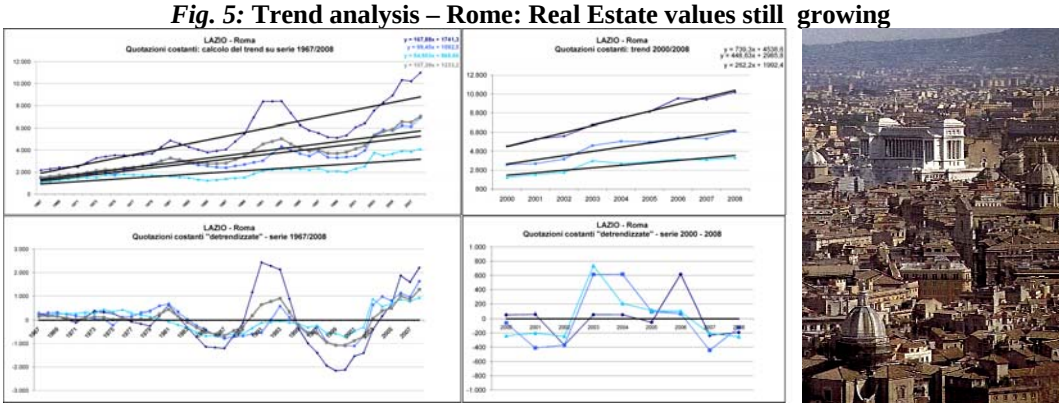


Fig. 6: **Trend analysis – Milan: the current slowdown waiting for 2015 EXPO challenge**

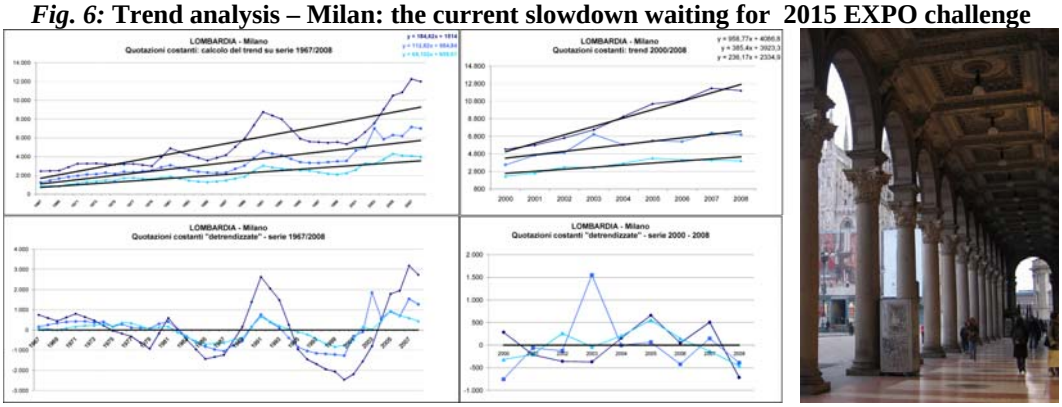
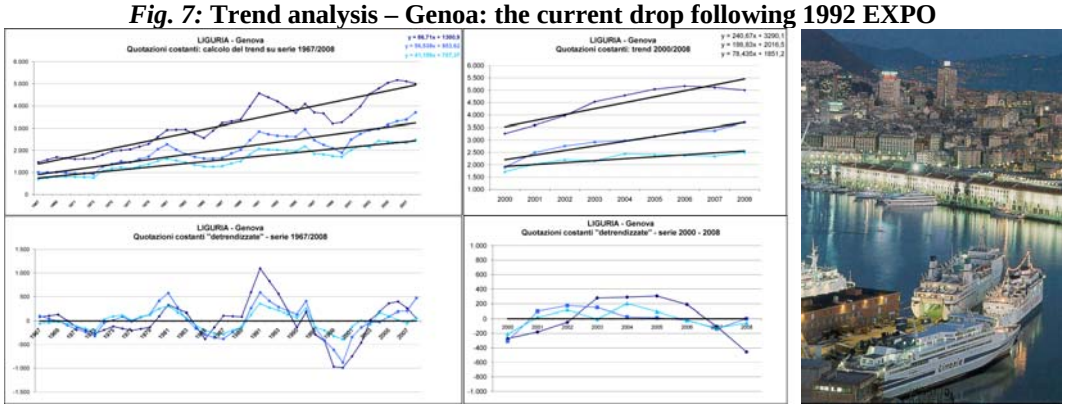


Fig. 7: **Trend analysis – Genoa: the current drop following 1992 EXPO**



Source: Authors processing on "Il Consulente Immobiliare" data.

1.1.2 Study n.1 - Conclusions

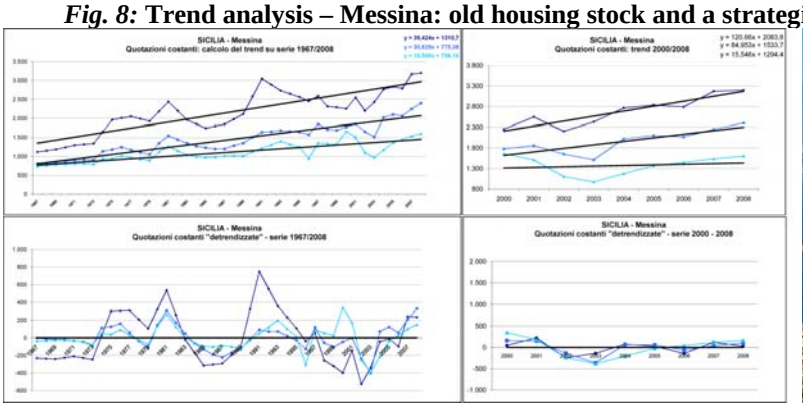
In brief the results suggest the following conclusions, presented by urban rank:

1. *The greatest metropolitan areas are at a disadvantage due to the following:*
   - they are more exposed to a systemic risk, due to their inner alignment to the international markets (not only Real Estate);
   - they tend to face the current market cycle reversal earlier than other urban areas;
   - they are losing demographic attractiveness;
   - they present a rather steady or decreasing level of profitability.

2. *Both the greatest metropolitan areas and the smaller towns can stand up to the crisis if they:*
   - maintain and renew their historical city centres, characterized by high international visibility (see: Venice, Siena, Matera);
   - have already started redevelopment policies in suburban and semi-central urban areas. This is the well known and typical situation of some big cities, in which, in recent years, thanks to EU structural funds, it has been possible to rebalance the land use, reconverting former industrial areas into new urban poles. This urban progress has quickly shifted the old "one-centre city" model to the more competitive "polycentric" one (Turin, in particular);
   - have recently taken the opportunity of hosting an important event (or will soon do so), as an occasion to re-launch their city plans, easily collecting investment funds. (i.e. Genoa, in 1992 for the American Discovery Anniversary; Turin, in 2006 hosted the 20th Olympic Winter Games, and Milan, waiting for the 2015 EXPO "challenge").

3. *At present, the cities and towns presenting key drivers are:*
   - some cities and towns to be re-launched through urban regeneration policies. It is a situation generally caused by belated redevelopment policies in historical city centres (see, for example: Lecce in Apulia; Ragusa, Siracusa and Messina, in Sicily);
   - minor cities, above all located in Lombardy and Emilia Romagna, in which some vital and strategic universities have settled their branches (Piacenza, Cremona, Perugia).

Fig. 8: **Trend analysis – Messina: old housing stock and a strategic harbour**



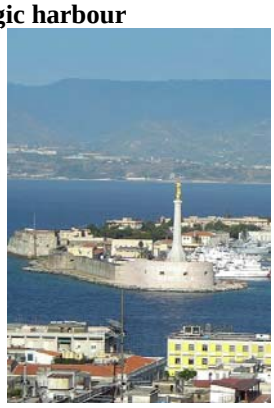
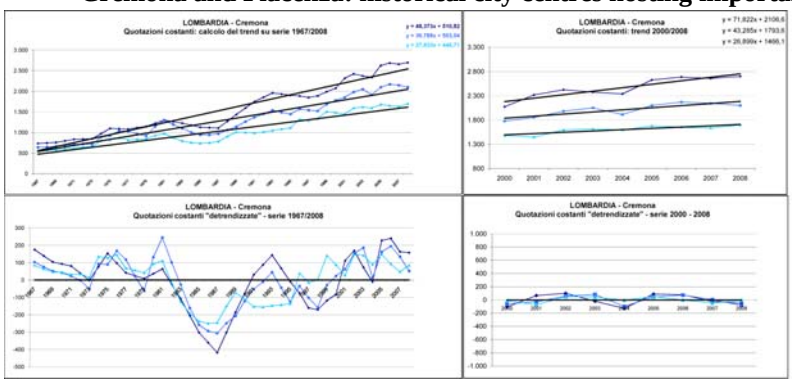
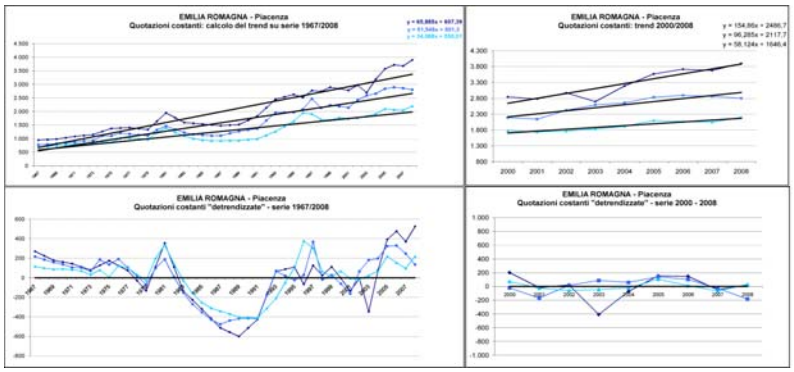


Fig. 9 - 10: **Trend analysis**
Cremona and Piacenza: historical city centres hosting important university branches





Source: Authors processing on “Il Consulente Immobiliare” data.

Fig.11: **Analysis by "geographical position"**

GEOGRAPHICAL POSITION	REGION	MAIN TOWN	TREND 1967 - 2008				TREND 2000 - 2008				% VAR. 2007 - 2008				DEM.	N° INHABIT.	MAXIMUM PRICE LEVEL	YIELD LEVEL 2008	YIELD PERFORMANCE 2002 - 2008
			C	S	P	average	C	S	P	average	C	S	P	average					
NORTH EAST	FRIULI VENEZIA GI	GORIZIA	129%	100%	145%	125%	16%	14%	16%	15%	-2%	-2%	-2%	-2%	LAST 10	36.110	1600	5%	-15%
NORTH EAST	FRIULI VENEZIA GI	PORDENONE	291%	395%	450%	379%	19%	27%	29%	25%	0%	3%	4%	2%		50.851	2600	4%	4%
NORTH EAST	FRIULI VENEZIA GI	TRIESTE	253%	262%	250%	255%	33%	52%	36%	40%	4%	2%	3%	3%	LAST 10	205.356	3200	5%	17%
NORTH EAST	FRIULI VENEZIA GI	UDINE	276%	302%	247%	275%	59%	73%	86%	73%	1%	2%	3%	2%		97.880	3300	4%	-7%
NORTH WEST	LIGURIA	GENOVA	250%	242%	225%	241%	55%	66%	33%	52%	-2%	10%	0%	5%	LAST 10	610.887	5000	4%	4%
NORTH WEST	LIGURIA	IMPERIA	1088%	1385%	573%	1015%	113%	102%	45%	86%	0%	-2%	-2%	-1%		41.500	4900	3%	-20%
NORTH WEST	LIGURIA	LA SPEZIA	428%	290%	262%	327%	54%	23%	7%	28%	-2%	-2%	-2%	-2%		94.834	3000	3%	-5%
NORTH WEST	LIGURIA	SAVONA	428%	290%	262%	327%	48%	53%	19%	40%	-2%	-2%	-2%	-2%		61.916	4000	3%	-6%
NORTH	LOMBARDY	BERGAMO	314%	249%	228%	264%	40%	57%	31%	43%	5%	5%	3%	4%		115.781	4500	4%	4%
NORTH	LOMBARDY	BRESCIA	475%	435%	409%	440%	49%	32%	31%	37%	2%	7%	-2%	2%		189.742	4800	3%	-13%
NORTH	LOMBARDY	COMO	206%	166%	194%	189%	55%	51%	42%	49%	-2%	1%	-2%	-1%		83.175	4000	4%	0%
NORTH	LOMBARDY	CREMONA	355%	279%	240%	292%	26%	19%	14%	20%	2%	-2%	4%	1%	TOP 10	71.998	2700	4%	16%
NORTH	LOMBARDY	MANTOVA	315%	206%	177%	233%	44%	36%	48%	43%	4%	2%	-8%	-1%		47.649	3400	1%	-25%
NORTH	LOMBARDY	MILANO	446%	421%	380%	416%	152%	72%	73%	99%	-2%	-2%	-2%	-2%	LAST 10	1.299.633	12000	11%	-25%
NORTH	LOMBARDY	PAVIA	363%	336%	270%	324%	105%	48%	37%	63%	-2%	1%	-2%	-1%	LAST 10	70.207	4300	3%	-33%
NORTH	LOMBARDY	SONDRIO	290%	193%	167%	217%	43%	29%	-1%	24%	-2%	-2%	-2%	-2%		22.214	3000	3%	-18%
NORTH	LOMBARDY	VARESE	111%	103%	133%	115%	60%	62%	61%	61%	4%	10%	3%	5%		82.037	3600	4%	-20%
NORTH WEST	PIEDMONT	ALESSANDRIA	165%	115%	148%	143%	23%	12%	3%	13%	-2%	-2%	-2%	-2%		92.839	2600	3%	-11%
NORTH WEST	PIEDMONT	ASTI	426%	220%	148%	265%	85%	65%	50%	67%	20%	17%	-2%	12%		74.549	4300	2%	-23%
NORTH WEST	PIEDMONT	CUNEO	243%	174%	105%	174%	34%	27%	35%	32%	-2%	-2%	-2%	-2%		54.970	3600	3%	25%
NORTH WEST	PIEDMONT	NOVARA	301%	245%	149%	254%	64%	58%	9%	44%	-2%	-6%	4%	-1%		102.862	3600	3%	0%
NORTH WEST	PIEDMONT	TORINO	103%	150%	218%	157%	37%	17%	34%	29%	3%	9%	7%	6%		908.263	4000	4%	33%
NORTH WEST	PIEDMONT	VERCELLI	146%	82%	90%	106%	19%	-5%	-12%	1%	-2%	-2%	-2%	-2%		44.475	2200	3%	8%
NORTH EAST	TRENTINO ALTO AI	BOLZANO	594%	910%	1013%	839%	122%	18%	4%	48%	10%	3%	-2%	4%		100.629	3300	3%	-6%
NORTH EAST	TRENTINO ALTO AI	TRENTO	572%	459%	376%	469%	97%	51%	38%	62%	5%	8%	7%	6%		112.637	6800	3%	-25%
NORTH WEST	VALLE D'AOSTA	AOSTA	264%	204%	206%	224%	46%	13%	24%	28%	-2%	-2%	-2%	-2%		34.726	2600	4%	-7%
NORTH EAST	VENETO	BELLUNO	173%	222%	200%	198%	-4%	11%	-1%	2%	-2%	-2%	-2%	-2%		36.361	2200	4%	29%
NORTH EAST	VENETO	PADOVA	659%	538%	356%	518%	61%	58%	24%	48%	0%	1%	3%	1%		210.173	4600	5%	15%
NORTH EAST	VENETO	ROVIGO	220%	199%	141%	187%	45%	34%	20%	33%	-2%	-2%	-2%	-2%		51.604	2100	4%	-11%
NORTH EAST	VENETO	TREVISO	826%	478%	277%	527%	82%	37%	34%	51%	0%	1%	-2%	-1%		81.642	5500	3%	-27%
NORTH EAST	VENETO	VENEZIA	901%	299%	644%	615%	71%	70%	99%	80%	11%	13%	0%	8%		268.993	8500	4%	22%
NORTH EAST	VENETO	VERONA	1179%	476%	328%	661%	93%	70%	32%	65%	9%	19%	7%	11%		264.191	6000	3%	-30%
NORTH EAST	VENETO	VICENZA	555%	449%	284%	430%	46%	51%	28%	41%	-2%	-2%	-2%	-2%		114.108	4000	4%	0%
CENTRAL	EMILIA ROMAGNA	BOLOGNA	291%	375%	475%	380%	54%	53%	53%	53%	5%	3%	4%	4%		372.256	5600	4%	13%
CENTRAL	EMILIA ROMAGNA	FERRARA	353%	279%	231%	288%	112%	57%	33%	67%	8%	7%	-2%	4%		133.591	3300	4%	-9%
CENTRAL	EMILIA ROMAGNA	FORLI'	423%	379%	286%	363%	26%	31%	27%	28%	-2%	-2%	-2%	-2%		114.683	2800	4%	32%
CENTRAL	EMILIA ROMAGNA	MODENA	1148%	822%	736%	902%	57%	33%	31%	40%	2%	1%	2%	2%		179.937	4500	3%	-26%
CENTRAL	EMILIA ROMAGNA	PARMA	1163%	841%	521%	841%	82%	67%	52%	67%	6%	6%	1%	4%		178.718	5400	3%	-28%
CENTRAL	EMILIA ROMAGNA	PIACENZA	401%	382%	239%	341%	47%	35%	27%	36%	6%	-2%	6%	4%		100.286	3900	3%	11%
CENTRAL	EMILIA ROMAGNA	RAVENNA	302%	242%	284%	276%	15%	30%	8%	17%	-2%	3%	-2%	-1%	TOP 10	153.388	2700	4%	-17%
CENTRAL	EMILIA ROMAGNA	REGGIO EMILIA	277%	401%	345%	341%	30%	29%	59%	39%	-2%	-2%	-2%	-2%		162.290	3300	3%	-13%
WEST COAST - CENTRAL	LATHIUM	FROSINONE	202%	118%	123%	148%	27%	11%	13%	17%	12%	1%	-2%	4%		48.285	2400	4%	0%
WEST COAST - CENTRAL	LATHIUM	LATINA	148%	243%	248%	213%	96%	103%	64%	88%	-2%	6%	9%	4%	TOP 10	115.490	3000	3%	-14%
WEST COAST - CENTRAL	LATHIUM	RIETI	136%	158%	144%	146%	70%	51%	40%	54%	-2%	9%	-2%	1%	TOP 10	47.617	2400	3%	-30%
WEST COAST - CENTRAL	LATHIUM	ROMA	361%	342%	244%	316%	112%	105%	93%	103%	8%	13%	6%	9%		2.718.768	11000	3%	-12%
WEST COAST - CENTRAL	LATHIUM	VITERBO	203%	188%	168%	186%	51%	39%	48%	46%	-2%	3%	-2%	0%	TOP 10	61.067	2700	4%	0%
EAST COAST - CENTRAL	MARCHE	ANCONA	534%	357%	426%	439%	35%	51%	52%	46%	-2%	-2%	-2%	-2%		101.424	3600	2%	-28%
EAST COAST - CENTRAL	MARCHE	ASCOLI PICENO	204%	262%	254%	240%	27%	28%	27%	27%	0%	-2%	4%	1%		51.629	2550	3%	8%
EAST COAST - CENTRAL	MARCHE	MACERATA	241%	249%	174%	221%	38%	52%	30%	40%	-2%	-2%	4%	0%		42.896	2700	3%	-14%
EAST COAST - CENTRAL	MARCHE	PESARO	618%	697%	915%	743%	61%	67%	73%	67%	0%	0%	4%	1%		93.488	4100	3%	-2%
WEST COAST - CENTRAL	TUSCANY	AREZZO	443%	294%	289%	342%	49%	42%	27%	39%	-2%	2%	-2%	-1%		97.493	3300	4%	0%
WEST COAST - CENTRAL	TUSCANY	FIRENZE	691%	447%	542%	560%	99%	75%	74%	83%	-2%	0%	1%	0%		364.710	6800	4%	-33%
WEST COAST - CENTRAL	TUSCANY	GROSSETO	525%	588%	459%	524%	96%	48%	54%	66%	-2%	0%	0%	-1%		78.823	3600	3%	-28%
WEST COAST - CENTRAL	TUSCANY	LIVORNO	526%	373%	355%	418%	150%	128%	100%	126%	0%	1%	1%	1%		160.949	4600	3%	-20%
WEST COAST - CENTRAL	TUSCANY	LUCCA	394%	312%	288%	331%	103%	76%	71%	83%	-2%	-2%	-2%	-2%		83.228	4100	3%	-5%
WEST COAST - CENTRAL	TUSCANY	MASSA	261%	179%	167%	202%	82%	62%	89%	78%	1%	-2%	3%	1%		69.941	3000	3%	-17%
WEST COAST - CENTRAL	TUSCANY	PISA	402%	357%	282%	347%	69%	77%	63%	69%	5%	1%	6%	4%		87.461	4300	4%	-7%
WEST COAST - CENTRAL	TUSCANY	PISTOIA	281%	277%	303%	287%	50%	40%	36%	42%	4%	-2%	-2%	0%	TOP 10	89.418	3200	4%	-6%
WEST COAST - CENTRAL	TUSCANY	SIENA	560%	1053%	92%	568%	104%	76%	122%	101%	-2%	-2%	1%	-1%		53.881	6000	3%	-5%
CENTRAL	UMBRIA	PERUGIA	268%	208%	245%	240%	2%	50%	56%	36%	-2%	-2%	-2%	-2%		163.287	3000	4%	79%
CENTRAL	UMBRIA	TERNI	283%	174%	197%	218%	83%	25%	35%	48%	-2%	-2%	-2%	-2%		110.933	3800	2%	-46%
EAST COAST - CENTRAL	ABRUZZO	CHIETI	157%	154%	203%	171%	88%	70%	54%	71%	6%	4%	-2%	3%		54.901	3300	2%	-7%
EAST COAST - CENTRAL	ABRUZZO	L'ACQUILA	165%	121%	174%	153%	112%	21%	34%	56%	3%	12%	-2%	4%		72.550	2200	4%	-11%
EAST COAST - CENTRAL	ABRUZZO	PESCARA	183%	161%	190%	178%	45%	79%	66%	63%	1%	11%	3%	5%	TOP 10	122.790	3500	4%	-2%
EAST COAST - CENTRAL	ABRUZZO	TERAMO	363%	254%	222%	280%	32%	52%	85%	57%	2%	-10%	-8%	-5%		54.763	2400	3%	9%
SOUTH EAST	APULIA	BARI	239%	262%	239%	247%	88%	72%	73%	78%	0%	4%	11%	5%	LAST 10	322.511	4700	3%	-11%
SOUTH EAST	APULIA	BRINDISI	160%	142%	128%	143%	29%	33%	12%	25%	3%	-2%	-2%	0%		89.979	2000	4%	9%
SOUTH EAST	APULIA	FOGGIA	178%	146%	150%	158%	29%	44%	40%	38%	-2%	-2%	-2%	-2%		153.469	2700	3%	13%
SOUTH EAST	APULIA	LECCE	244%	252%	178%	224%	56%	42%	25%	41%	-2%	4%	5%	2%		94.178	2600	4%	10%
SOUTH EAST	APULIA	TARANTO	233%	191%	136%	186%	66%	71%	48%	62%	8%	16%	4%	10%	LAST 10	195.130	3100	3%	-6%
EAST COAST - CENTRAL	BASILICATA	MATERA	150%	131%	157%	146%	222%	42%	43%	102%	10%	-2%	-2%	2%		60.171	2800	3%	-37%
EAST COAST - CENTRAL	BASILICATA	POTENZA	172%	135%	117%	141%	28%	57%	54%	46%	-2%	-2%	-2%	-2%		68.013	2500	4%	0%
SOUTH WEST	CALABRIA	CATANZARO	312%	176%	107%	198%	112%	7%	26%	49%	3%	4%	0%	2%		94.004	2200	3%	47%
SOUTH WEST	CALABRIA	COSENZA	295%	211%	169%	225%	132%	83%	59%	91%	-2%	-2%	-2%	-2%		69.657	2100	3%	-13%
SOUTH WEST	CALABRIA	REGGIO CALABRIA	243%	176%	115%	178%	117%	170%	158%	148%	-2%	-2%	-2%	-2%		185.577	3000	4%	-33%
WEST COAST - CENTRAL	CAMPANIA	AVELLINO	147%	96%	24%	89%	102%	48%	22%	57%	-2%	-2%	-2%	-2%		57.071	3000	3%	12%
WEST COAST - CENTRAL	CAMPANIA	BENEVENTO	44%	68%	45%	52%	58%	36%	26%	40%	6%	4%	7%	5%		62.827	2600	3%	-27%
WEST COAST - CENTRAL	CAMPANIA	CASERTA	124%	265%	273%	221%	106%	88%	68%	87%	-2%	-2%	-2%	-2%		78.703	3700	3%	-13%
WEST COAST - CENTRAL	CAMPANIA	NAPOLI	1109%	1147%	355%	870%	120%	145%	83%	116%	-2%	-2%	8%	1%	LAST 10	973.132	9000	3%	1%
WEST COAST - CENTRAL	CAMPANIA	SALERNO	1390%	1045%	601%	1012%	110%	101%	57%	90%	-2%	-2%	-2%	-2%		140.580	6000	3%	-31%
SOUTH	MOLISE	CAMPOBASSO	181%	147%	126%	151%	69%	61%	46%	59%	1%	-2%	-2%	-1%		51.321	3100	3%	-15%
SOUTH	MOLISE	ISERNIA	137%	83%	48%	89%	45%	35%	15%	32%	3%	4%	-2%	2%		21.773	2200	3%	-18%
ISLANDS	SARDINIA	CAGLIARI	282%	442%	229%	318%	99%	97%	45%	81%	18%	14%	20%	17%		158.041	4600	3%	-39%
ISLANDS	SARDINIA	NUORO	179%	149%	151%	100%	21%	44%	39%	35%	-2%	-2%	-2%	-2%		36.497	1700	4%	-7%
ISLANDS	SARDINIA	ORISTANO	291%	242%	232%	255%	55%	29%	33%	39%	7%	4%	-2%	3%	LAST 10	32.618	2300	3%	-22%
ISLANDS	SARDINIA	SASSARI	286%	202%	130%	206%	53%	50%	45%	49%	-2%	3%	-2%	-1%		129.086	2700	4%	3%
ISLANDS	SICILY	AGRIGENTO	232%	127%	112%	157%	64%	28%	10%	34%	-2%	-2%	-2%	-2%		59.152	2800	2%	-17%
ISLANDS	SICILY	CALTANISSETTA	195%	234%	188%	205%	55%	74%	67%	65%	-2%	-2%	35%	10%		60.139	2000	4%	-16%
ISLANDS	SICILY	CATANIA	318%	257%	205%	259%	91%	64%	62%	73%	3%	5%	3%	4%		298.957	4300	3%	-12%
ISLANDS	SICILY	ENNA	120%	80%	35%	78%	64%	76%	66%	69%	-2%	-2%	7%	1%		28.125	2000	3%	-38%
ISLANDS	SICILY	MESSINA	120%	157%	88%	121%	44%	42%	9%	32%	1%	7%	4%	4%		243.997	3200	4%	10%
ISLANDS	SICILY	PALERMO	272%	313%	236%	275%	73%	53%	54%	60%	0%	1%	8%	5%		663.173	3900	4%	-6%
ISLANDS	SICILY	RAGUSA	198%	174%	207%	256%	71%	77%	44%	64%	-2%	3%	-2%	0%		72.511	1600	4%	12%
ISLANDS	SICILY	SIRACUSA	129%	130%	84%	114%	9%	12%	21%	14%	-2%	-2%	-2%	-2%		123.595	2500	4%	20%
ISLANDS	SICILY	TRAPANI	159%	158%	115%	144%	54%	39%	20%	38%	-2%	-2%	-2%	-2%		70.638	2100	3%	-23%
		SUBTOTALI (MEDIA)	359%	311%	256%	308%	66%	52%	43%	54%	1%	2%	1%	1%			3.704	3%	-7%
		SUBTOTALI (MAX)	1390%	1385%	1013%	1015%	222%	170%	158%	148%	20%	19%	35%	17%			12.000	11%	79%
		SUBTOTALI (MIN)	44%	68%	24%	52%	-4%	-5%	-12%	1%	-2%	-10%	-8%	-5%			1.600	1%	-46%

Legend

- C — Central locations/areas
- S — Mid - central districts
- P — Suburbs
- average — Average % among C-S-P
- DEM. — Demographic attraction
- LAST 10 / TOP 10 — in the demographic ranking INDEX

Trend %

- Maximum increase
- High increase
- Medium - high increase
- Medium increase
- Medium - low increase
- Low increase
- Minimum increase or steady
- Steady or low descrease
- Medium descrease
- Critical decrease

Average %

- Maximum increase
- Medium - high increase
- Medium increase
- Medium - low increase
- Steady or decreasing

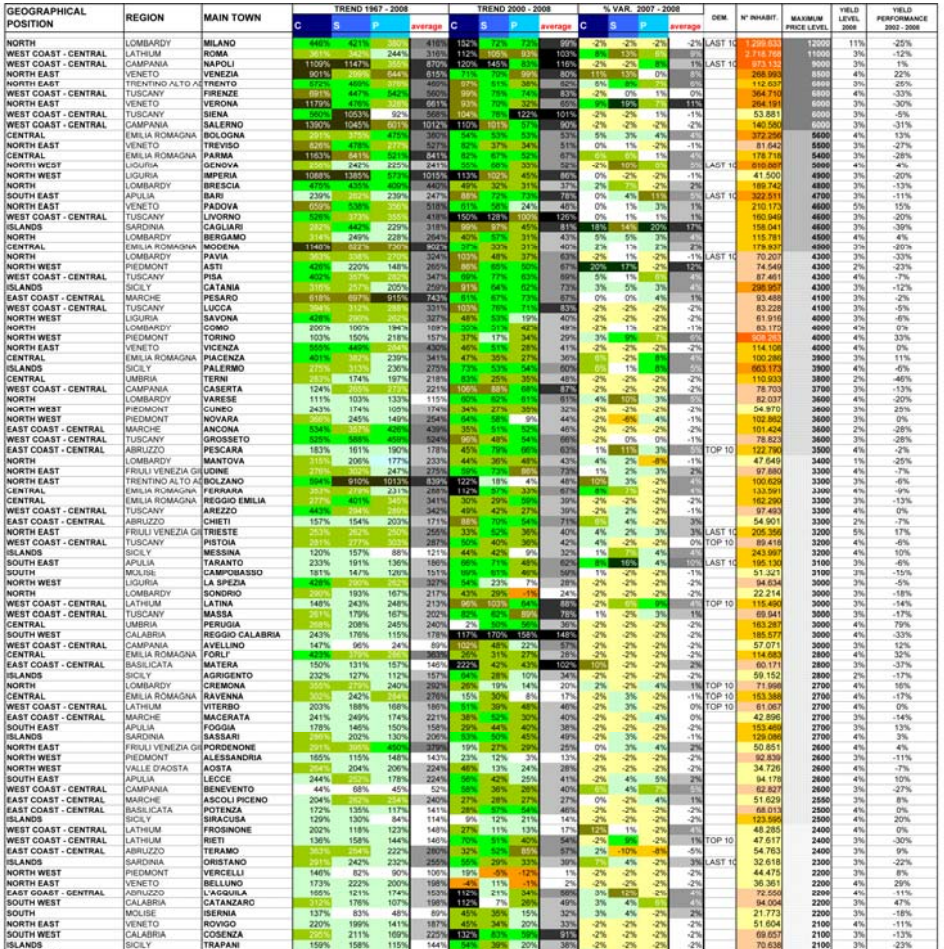
Urban rank (n° inhabitants)

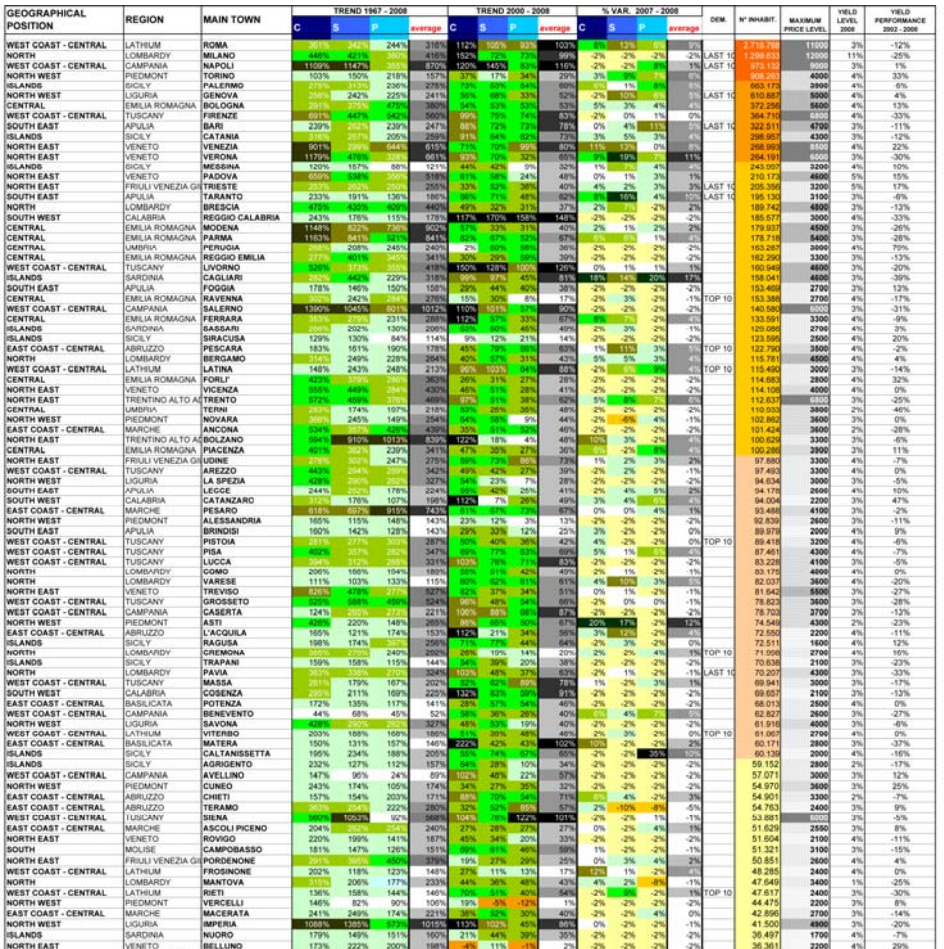
- 1°- Metropolitan areas (> 800.000 inhab.)
- 2°- Major cities (800.000 - 250.000 inhab.)
- 3°- Medium cities (250.000 - 100.000 inha
- 4°- Minor cities (100.000 - 50.000 inhab.)
- 5°- Very little cities (50.000 - 20.000 inhab

Source: Authors processing on "Il Consulente Immobiliare" data.

Fig.12 : **Analysis by "price level"**

Fig.13 : **Analysis by "urban rank"**





Source: Authors processing on "Il Consulente Immobiliare" data.

1.2 Study n.2 - Trend of the spatial uniformity of the real estate value[22]

This study illustrates two coefficients useful to study the spatial distribution of the real estate value in cities and, joining to the aim of this paper, moreover, it analyses the trend of the distribution of these coefficients through the years[23].
This kind of analysis may be interesting to find some relations with other factors like urban transformations[24] (dynamic aspect), population[25] and present urban appearance[26] (static aspect).

1.2.1 Study n.2 - Relative Gap

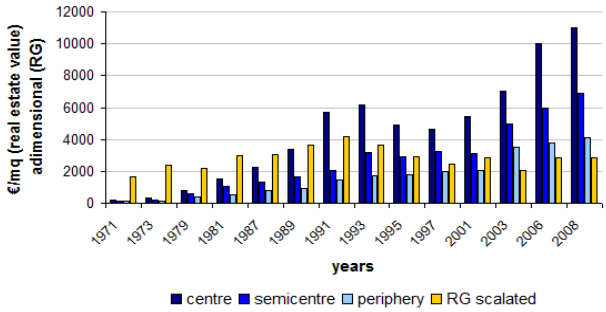
The Italian real estate value data set used in this work[27] divides each city in three [areas]: central, semi-central and peripheral areas. Then, for each Italian city we know the average real estate value in these three areas.
From these data we can calculate a coefficient measuring the gap of the real estate value through the city. We call this coefficient: Relative Gap (*RG*) and it is determined as the ratio of the difference between the maximum and minimum values, and the average of the maximum, the intermedium and the minimum values. We write generically maximum, intermedium and minimum value, recalling that we mean the central, semicentral and peripheral value. But not always the maximum is in the centre, and the minimum in the periphery, then, in the follow general formula, we prefer to write maximum, intermedium and minimum value:

$$RG = \frac{\max - \min}{(\max + \text{intermediu m} + \min)/3}$$

The aim of this paragraph is to show the trend of RG over the period from 1967 to 2008 in the most important Italian cities and to find some conclusions.
Changes in this coefficient through the years can be mathematically explained only by different percentages of increase/decrease in the maximum, intermedium and minimum values. Different percentages of increase/decrease in these three values could be caused by a different impact on the central, semi-central and peripheral real estate values due to macro/microeconomic factors, or produced by the location and importance of urban transformations.
We show as example of reflection (repeatable in each city) the case of Roma. The following histogram evidences the different increase/decrease in the real estate values of central, semi-central and peripheral areas for some significant years. Looking at these differences it is easy to understand the RG values.

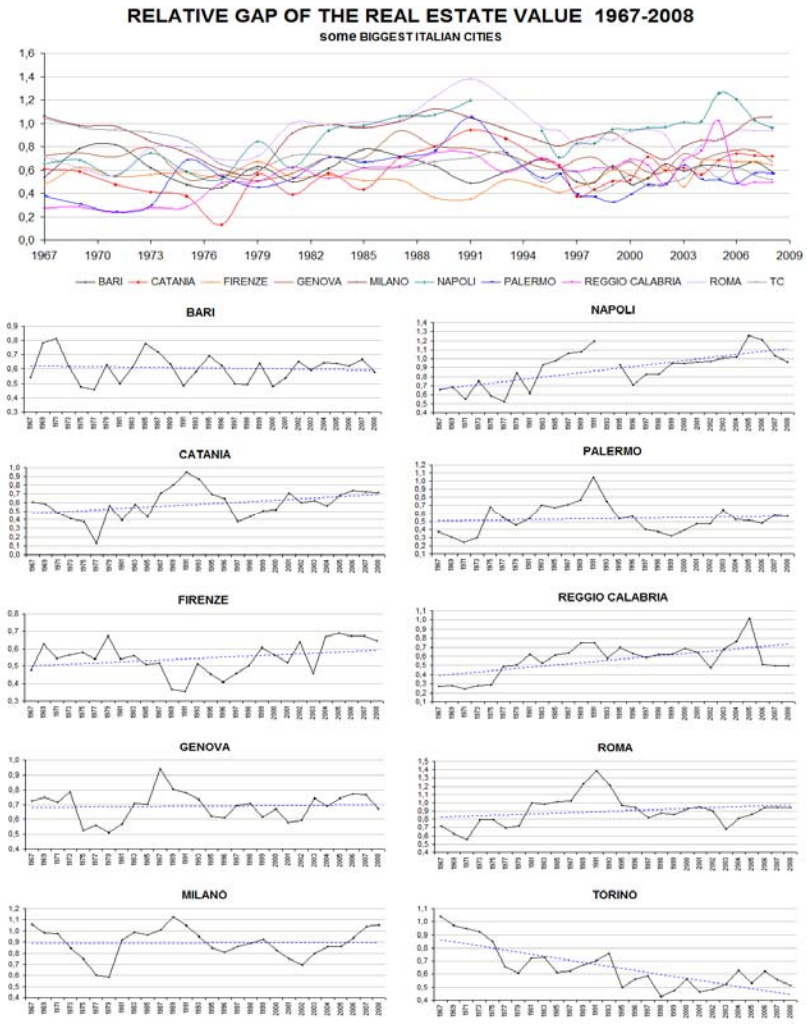
[22] Study n.2 was carried out by dott. Luca D'Acci.
[23] In this paragraph we use two different data set of national real estate value: "Il Consulente Immobiliare" and "Gabetti Agency". The first is useful because of its long time series (from 1967 to today), the second one because of its high number of areas in which every city is divided. The paragraph 1.2.1 uses the first data set; the paragraph 1.2.2 the second one.
[24] Fig 7.
[25] Fig 5.
[26] Fig 4.
[27] "Il Consulente Immobiliare".

***Fig. 1*: RG and Real Estate Value: an example in Roma**



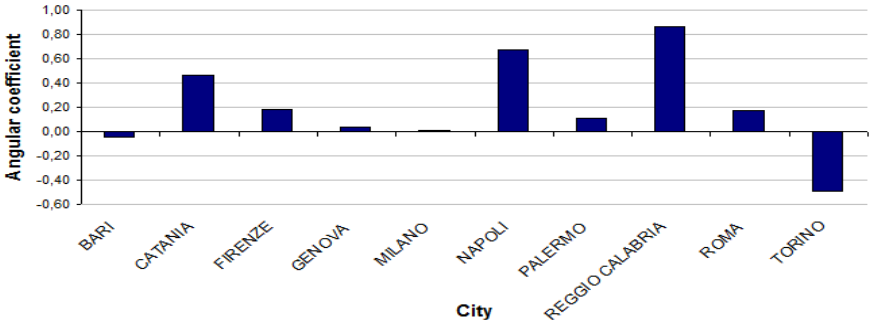
Source: Author processing on "Il Consulente Immobiliare" data.

***Fig. 2*: RG in some of the biggest Italian cities between 1967 and 2008**



Source: Author processing on "Il Consulente Immobiliare" data.

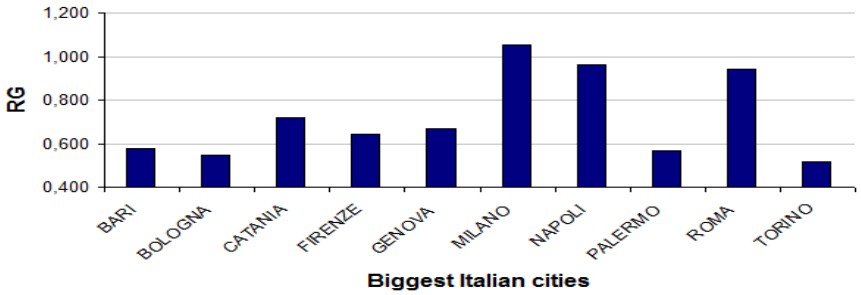
***Fig. 3:* Angular coefficient of the linear RG trend between 1967 and 2008**



Source: Author processing on "Il Consulente Immobiliare" data.

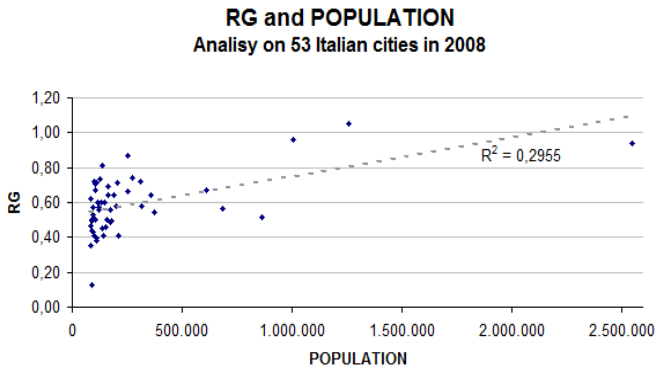
By the Fig 2 we can notice how the case of Torino is different in comparison with the other cities analysed here. Almost every city has a linear RG trend close to zero or slightly positive. Torino is the only city showing a strong negative linear *RG* trend (Fig 3).
Also a static comparison between the biggest Italian cities in the year 2008 shows Torino as the city with the lowest value of *RG* (Fig 4).

***Fig. 4*: Relative Gap in the year 2008**



Source: Author processing on "Il Consulente Immobiliare" data.

Fi. 5: Relative Gap and Population



Source: Author processing on "Il Consulente Immobiliare" data.

The Fig 5 compares the *RG* coefficient and the population in each city to study how strong this relation is. The low value of the R^2 coefficient of the linear regression (0,2995) indicates that this relation is not evident, although the three biggest Italian cities (Roma, Milano and Napoli) have the highest value of RG, and the smallest ones have the lowest RG. However, not always the bigger a city is the higher RG is, and then the more uneven the spatial distribution of the real estate value is. Torino is just an example of a big city with a low RG coefficient value.

1.2.2 Study n.2 - Dispersion

The *RG* coefficient defined in the previous section is calculated by a data set in which every city is divided in three areas: centre, semi-centre and periphery.
For a more detailed investigation about the spatial distribution of the real estate value it is necessary a data set dividing cities in the most possible areas. Then we use the *Gabetti Agency* data set[28] that divides each city in a lot of areas (for example Torino is divided in 70 areas). This data set allows calculating a new coefficient better estimating the distribution of the real estate value in each urban area.
We call this coefficient *Dispersion* and it is the ratio between the standard deviation of the values in each area and the average value.
As before, we consider just the most important cities in Italy, thinking it is more correct for a comparison with the urban dimension of Torino[29]. The years used are 1997 and 2005 because there are some differences among the urban areas used in the Gabetti data set in 1997 and 2008, and we would utilize the same areas to get a righter result.

The *Dispersion* increase/decrease for each city is:
- Roma=+9%,
- Milano=-16%,
- Napoli=-10%,
- Torino=-30%,
- Genova=-20%,
- Bologna=+68%,
- Firenze=-19%,
- Bari=21%.

The average decrease (without the outlier Bologna) is -15%.

Then also in this case we observe how Torino shows a stronger decrease in this coefficient (-30%).
After these results we have some reasonable information to think that an important explanation for the particular negative RG trend and the *Dispersion* trend of Torino as well as its present low *RG* value, is the remarkable amount of urban transformations carried out during these last decades[30] in comparison with the other Italian cities considered in this work.
A specific simulation for Torino by *UrAD* model[31], measuring the Social Benefit[32] given from urban attractions (Fig 6), showed in fact a strong relation between urban transformations and real estate value (Fig 7). Here we cannot explain all the meanings of the following imagines, but we can just say that the Fig 6 shows the spatial distribution of the effect of the most important urban attractions, before and after the deep urban transformations of the last decade.

[28] We wish to evidence how different kind of data sets can show different results. In this case only using the "Gabetti" data set we can notice the strong decrease of the Turin's RG through the years 1997-2005, and not using the "Il Consulente Immobiliare" data set. This also because the first data set divided the Turin's area in 70 parts, whereas the second data set divided the Turin's area in 3 parts.

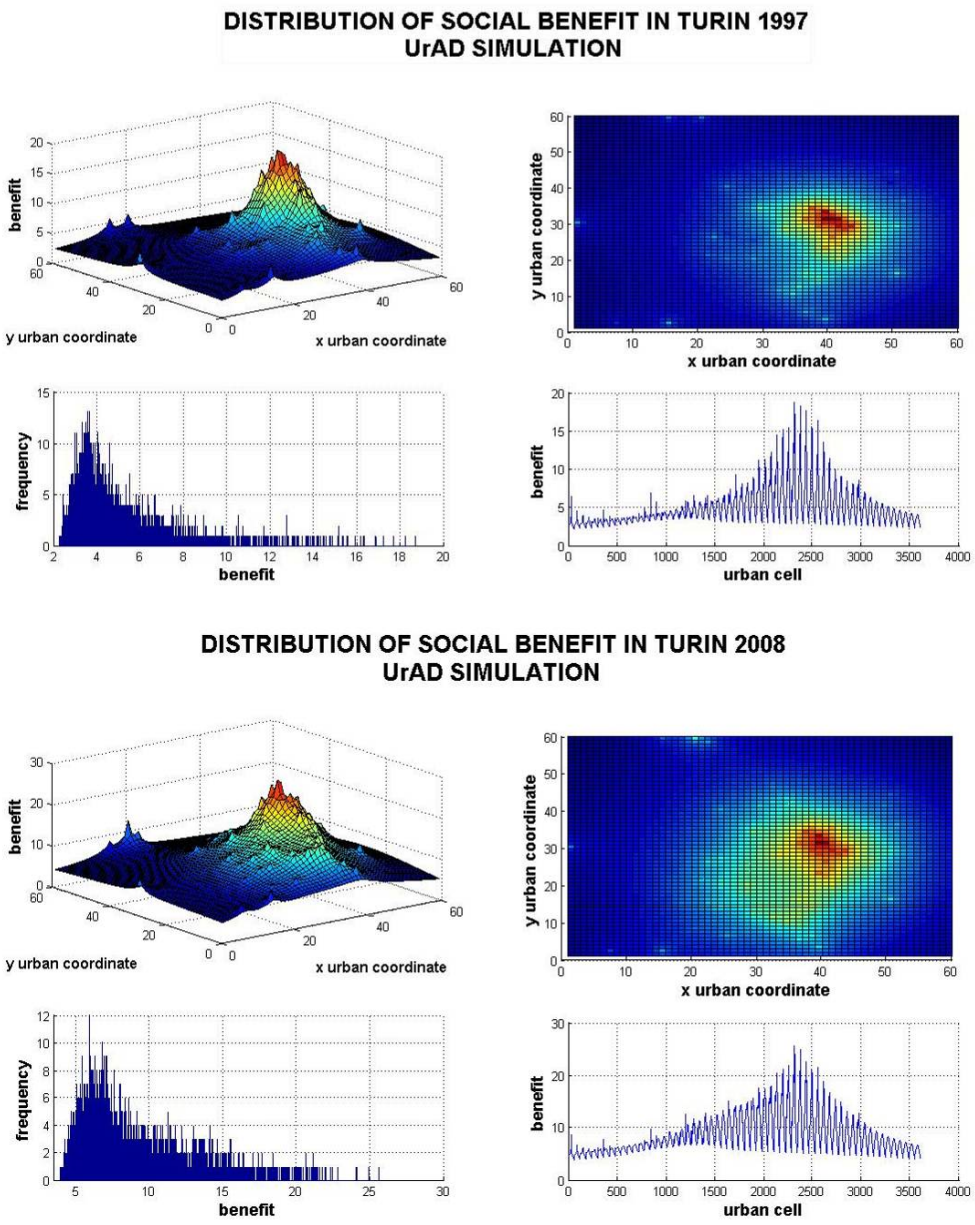
29 Even after the considerations written about the low value of R^2 in Fig 5.

[30] See: http://www.comune.torino.it/periferie/;
http://www.oct.torino.it/index0.htm ;

[31] D'Acci L. (2009a, b).

[32] It is the benefit given by the amenities-beauties (attractions) improving the urban life quality of an ordinary citizen. The value of use, defined as a value assigned to goods in function of their own capacity to satisfy our exigencies, is connected to the exigency of *urban life['s] pleasantness*. Then the public-goods, in which the *UrAD* model is interested, are attractions like nice gardens and parks, pedestrian areas, cultural amenities, agreeable places and streets, pleasant shopping areas and so forth.

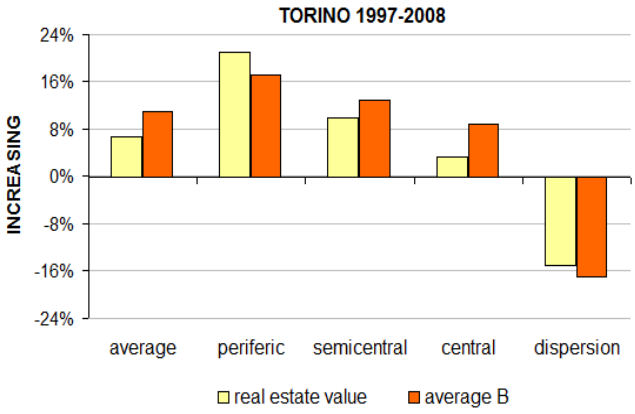
Fig. 6: **Urban transformations and Social Benefit in Torino**



Source: D'Acci L. 2009b

The Fig 7 shows the relation between the real estate value observed and the simulated Social Benefit given from urban transformations (B). The coefficient "average B" is the average value of B simulated by *UrAD*[33].

Fig. 7: **Real estate value and urban transformation**



Source: UrAD simulation

1.2.3 Study n.2 - Conclusions

The spatial distribution of the real estate value has been measured by *RG* and *Dispersion* coefficients. After the trend analysis of these coefficients we can say that an important reason for the spatial distribution of the real estate value (as the example of Torino[34] showed) is the localization of the urban attractions. This consideration is rather easy to say even without a scientific support, because everybody knows that usually the nicer the area is the higher the real estate value is. This short study just shows a possible way to quantify this relation.

[33] More information about the "UrAD – Urban Attraction Distribution - Model" is available on line: www.urem.eu

[34] We recall that in this short paragraph we just wish to show the *RG* trend in some most important Italian cities. We also have tried to give one of the possible reasons about the *RG* decrease in Torino during the last years. But the Fig. 2 shows that the most *RG* decrease in Torino is in the years before that in this paragraph we haven't studied.

1.2.4 References

Introduction and Study n.1

1. "Il Consulente Immobiliare", published by *Il Sole24Ore*.
2. ISTAT 2008 – Population Census Data.
3. III Real Estate Report – Nomisma 2007.
4. III Real Esatte Report – Nomisma 2008.
5. Erbani. F., *Quando esplode la periferia*, La Repubblica, 16 marzo 2006.
6. www.scenari-immobiliari.it
7. www.nomisma.it
8. www.ubh.it
9. www.gabetti.it

Study n.2

10. D'Acci L. (2009a), *A mathematical aid for efficient distribution of social benefit in urban planning*, INPUT '08 Conferenza Nazionale in Informatica e Pianificazione Urbana e Territoriale. Lecco, 4 - 6 marzo 2009 (in press).
11. D'Acci L. (2009b), *Spatial Distribution of Social Benefit Given by Urban Attractions: a Test of UrAD Model*, Lecture Notes in Computer Science LNCS 5592, pp. 237–252, 2009. Springer-Verlag, Berlin Heidelberg.
12. D'Acci L. (2008), *Growths, urban transformations, real estate positional value: Econometric cellular automata for the simulation of the positional value: An application for Turin*, Lecture Notes in Computer Science LNCS, vol. 5072, pp. 96–110. Springer, Berlin Heidelberg.
13. D'Acci L., Zorzi F. (2007), *Un modello per la simulazione dei valori immobiliari*, in: Sistemi economici locali e mercati immobiliari, E. Mollica (a cura di), Gangemi, Roma.
14. D'Acci L. (2007), *SiVa: Econometric Cellular Automata for a simulation of real estate values*, in ERES 14th Annual European Real Estate Society Conference, June 27, 2007, London.
15. D'Acci L., Rosasco P., (proceeding), *Urban transformations, Social Benefit, Real estate value: a* comparison between Turin and Genoa.
16. "Il Consulente Immobiliare", published by *Il Sole24Ore*.
17. www.gabetti.it
18. ISTAT 2008 – Population Census Data.